THE BRAIN ADVANTAGE

BECOME A MORE EFFECTIVE LEADER USING THE LATEST BRAIN RESEARCH

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THE ADVANTAGES OF BRAIN RESEARCH

Contemporary brain research might seem like a funny place for people to look for ideas about how to improve their leadership skills. After all, neuroscience is about understanding the brain, not helping leaders run their organizations.

Leadership was not on the curriculum when I was a graduate student in neuroscience, but it did come up once. I recall reading a local newspaper article about some new findings from the laboratory of Steve Hillyard, one of my mentors at the University of California, San Diego. The article described investigations of brain potentials in people who visited the lab to volunteer for the recordings—so far, so good. But the journalist's overstatement was that modern brainwave technology could provide scientific predictions about a person's future success through a brain measure called the "leadership potential." This brings to mind bizarre visions of a corporate culture in which each employee is regularly hooked up to a machine to look inside the brain, and then the machine decides who gets a promotion and who gets sacked. In actuality, the journalist must have been making a pun, conflating leadership capacity with electricity in the form of brain potentials.

Indeed, neuroscientists have discovered many interesting brain potentials—including face-processing potentials, memory-formation potentials, decision-making potentials, error-monitoring potentials, and so on—but as far as I know, no one has yet discovered one that deserves to be called the leadership potential. Still, journalistic word play aside, there may be some truth to the idea that brain science can help build better leadership qualities.

Leaders want to understand human thought and behavior in order to be more effective. As this book shows, understanding scientific research on the human brain is essential to that endeavor.

After all, the reasons why we behave as we do, and explanations for human cognition more generally, derive from the way the human brain works. Even the way we comprehend reality is, in no small part, a function of human perceptual capabilities. Human beings do not know the world in an absolute sense. What we know is conditioned by the types of environmental signals that can be registered by our sense organs. We see only certain wavelengths of electromagnetic radiation (light). We hear only certain frequencies of pressure waves travelling through the air (sound). We recognize only certain chemicals that make their way to the right place on our bodies (taste and smell). And the story doesn't stop there because our take on these sensory signals is a function of our ability to analyze and extract meaning from them. It is our brainpower that determines how we make sense of the world. In a very real sense, our world is not really a separate external place. What we know is a function of the outside world and of the inside—a result of neural processing.

In many more concrete (and less esoteric) ways, neuroscience research seeks greater understanding of perception, memory, decision making, and all other aspects of human behavior.[1] As this understanding continues to develop, we become better able to explain mental abilities in adults, how these abilities develop in children, and how they change as people's brains get older. These scientific approaches often connect directly to disorders of brain function, informing the diagnosis and treatment of various diseases. As we understand more about how learning takes place, we strive for ways to improve educational methods. And as our understanding of emotion deepens, we seek better methods for dealing with our emotions and emotional malfunctions. Acquiring knowledge about the basic principles of brain function can lead us in surprising new directions with unforeseen benefits; we don't always know in advance where the next miracle cure, novel insight, or boon for society might materialize. The scope of the potential implications of neuroscience research is remarkably wide ranging.

Although the chief aim of this book is to provide useful leadership

advice, it also includes a glimpse into how neuroscience contributes to understanding the mind. Of course, evaluating specific neuroscientific findings is very different from evaluating the practical advice this book provides. In this vein, I'd like to take a moment to examine how advances in neuroscience arise.

The scientific challenge includes various steps required to understand basic brain mechanisms. Consider the possibility that some scientific claims about the brain may ultimately turn out to be incorrect. Would this impugn the leadership ideas prompted by the science and offered in this book?

Certainly many of the scientific findings that Madeleine, Lisa, and Brad selected to include in the leadership context could, in another context, be analyzed, probed, and questioned in great detail. Neuroscientists love to do that. These are the steps that are regularly taken in the course of research. There may be alternative or more complex interpretations of the results, shortcomings in experimental designs, and countless factors that limit the confidence one might have in the evidence acquired or the conclusions drawn.

Usually we begin by asking questions of nature. Then we strive to obtain sensible answers based on observations that are interesting and convincing, answers that make the most sense when considering all the alternatives. Some of these answers will stand the test of time—the test of future experiments that could either produce converging findings or findings that cast doubt on the original results. Many experts in the field will judge and weigh all the evidence. The most convincing scientific propositions will be those supported not by just a single experiment but by the weight of evidence from many research studies.

To make the best use of neuroscience research in a leadership context, then, should we wait for the final word, the conclusion verified by the most weighty and convincing evidence? As it happens, there is no such thing as the final word. All scientific hypotheses are provisional—every single one. Scientists must always be open to the prospect of changing their minds in the face of new evidence that demands a new understanding. At least, that's the ideal. We may not always be completely open to change. People like to grasp on to hypotheses that they have long held close. Neuroscientists are people too, subject to these same tendencies. But at least in principle, our scientific understanding of the human brain is fluid, always on the move—sometimes unpredictably so.

In many places in this book, presumed functions of particular brain areas are brought up to help make a leadership point. However, the human cerebral cortex is a vast and mysterious collage of brain networks and our current knowledge of how to map specific functions to each patch of cortex is a work in progress. When I see a statement like "activation was found in brain area X, which is thought to be essential for cognitive function Y," I often wonder—thought by whom? Perhaps by one set of investigators who are in battle with a different set of investigators who think that brain area X does something entirely different. These controversies abound, but for the purposes of this book, putting them aside is best.

Besides, in time these controversies tend to resolve into a consensus and an enriched understanding. And yet, we can't always foresee who will win the argument and what our future understanding might hold. In some cases the role attributed to a brain region in cognition fits with evidence from many neuroscience methods. We might then relax our concerns about the shortcomings of any single research method. The hypothesis can then be considered relatively firm. Other times, speculations have a weaker basis.

The challenge of developing hunches and speculations into solid scientific advances is extended yet further when we attempt to translate neuroscientific knowledge so that it can be applied outside the laboratory. Whereas all our hypotheses are subject to change, in subtle ways or with an all-out refutation, this state of affairs does not necessarily take away from the potential usefulness of the leadership implications drawn out in this book. The question is whether these ideas are useful. If they help a leader to be more effective, then they should be taken seriously.

I'd also like to highlight how engaging a challenge it can be to attempt to solve a mystery, in this case the mystery of how each little patch of the human cerebral cortex contributes to mental functions. In light of the way one cortical network can routinely interact with other networks located in distant regions of the brain, cognition is seemingly a product of the whole. Nearly the whole brain might become involved in some complex computation. Nonetheless, discrete networks in the brain do

carry out unique sorts of computations. We are reminded of this by the dramatically specific problems people sometimes experience after damage to the brain.[2] There are many examples in which brain injury produces one cognitive disability alongside otherwise preserved abilities:

- preservation of elementary visual abilities with impaired access to the meaning of objects (*visual agnosia*),
- preservation of some object perception with impaired face perception (*prosopagnosia*),
- preservation of some visual abilities with impaired conscious vision (*blindsight*), and
- preservation of many abilities to learn from experience with impaired storage of memories for autobiographical episodes and complex facts (*amnesia*).

Among other more outlandish examples, a patient with *Capgras syndrome* may recognize his wife's face but suffer from the delusion that she is an imposter, not really his wife. Other examples are described in the "What's the Story?" sections of this book.

We can learn about the human mind not only from these selective cognitive impairments in patients but also from technologies that provide complementary evidence and that make it possible to examine the brain in exquisite detail and to monitor it in action. Many brain scanning and brainwave recording methods can be applied in healthy individuals with minimal risks to the volunteers.

While this research advances our scientific understanding step by step, we also acknowledge the enormity of this challenge. Neuroscientists often focus on a specific cognitive function or brain region and attempt to gain some understanding. A standard tactic is to isolate one phenomenon for study by holding other phenomena constant or putting everything else aside. How is this done? Ideally, we try to carve nature at her joints, meaning that we strive to isolate the topic of study in a way that makes good sense. Perhaps in some instances we have mistakenly subdivided phenomena, cutting in the wrong place, failing to carve up nature properly. This certainly happens.

But even when we succeed in finding the appropriate divisions so as to carve nature exactly at each joint, we may still do violence by this carving.[3] In other words, the very divisions and categorization schemes that we use to identify and study distinct phenomena can introduce some distortion. It seems that we must zero in and identify the parts to achieve any understanding, but in doing so we may neglect aspects of the whole that are out of focus when only analyzing the parts. Neurocognitive phenomena need to be understood both in relative isolation and in context. The context may involve the individual's other cognitive functions, hormones, diet, social milieu, broader culture, and all the influences that have accrued through that individual's lifelong development and shape the kinds of thoughts he or she experiences.

After taking the pieces apart in our analyses, we can attempt to remedy this situation by putting the pieces back together (in theory) in a way that calls attention to the interdependence among them. We still have much to learn about how the presumed function of each patch of cortex operates in a greater context, such as in the midst of large-scale cortical networks[4] and in the face of an array of environmental and cultural influences.[5] These complexities are no cause for disillusionment for neuroscientists. Rather, it remains an exciting time to be in the business of deciphering the mysteries of human neurocognitive functions.

As a final thought about the relevance of neuroscience for leadership, I'd like to put some stress on integrity. This book is full of useful ideas that emerge from neuroscientific considerations. However, ethics may not always come along for the ride when we learn about all the ways in which we might use our brains better and improve our talents.[6] In the workplace, as anywhere, allowing our actions to be guided by ethical principles is of primary importance. Integrity and compassion for others should be Job Number One. Hopefully a neuroscientific understanding of the human mind will ultimately shed further light on why these principles are so important.

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NOTES

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